ABSTRACT OF THE DISCLOSURE

A neural network computer (20) includes a weighting circuit (21) coupled to a plurality of phase-locked loop circuits (25_1-25_N). The weighting circuit (21) has a plurality of weighting circuits (C_{11}, ..., C_{NN}) having output terminals connected to a plurality of adder circuits (31_1-31_N). A single weighting element ($C_{k,j}$) typically has a plurality of output terminals coupled to a corresponding adder circuit (31_k). Each adder circuit (31_k) is coupled to a corresponding bandpass filter circuit (35_k) which is in turn coupled to a corresponding phase-locked loop circuit (25_k). The weighting elements ($C_{1,1}$, ..., $C_{N,N}$) are programmed with connection strengths, wherein the connection strengths have phase-encoded weights. The phase relationships are used to recognize an incoming pattern.

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